NATURAL RESOURCES CONSERVATION SERVICE

# RESIDUE MANAGEMENT, MULCH TILL

## (Acre)

## CODE 329B

### DEFINITION

Managing the amount, orientation, and distribution of crop and other plant residue on the soil surface year-round, while growing crops where the entire field surface is tilled prior to planting.

### PURPOSES

This practice may be applied as part of a conservation system to support one or more of the following:

1. Reduce sheet and rill erosion.
2. Reduce wind erosion.
3. Maintain or improve soil organic matter content and filth.
4. Conserve soil moisture.

### CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all cropland and other land where crops are grown.

This standard includes tillage methods commonly referred to as mulch tillage, or chiseling and disking. It applies to stubble mulching on summer fallowed land, to tillage for annually planted crops, and to tillage for planting perennial crops.

### CRITERIA

#### General Criteria Applicable to all Purposes Named Above

1. Loose residue to be retained on the field shall be uniformly distributed on the soil surface. Combines shall be equipped with spreaders capable of redistributing residue over at least 80 percent of the working width of the header.
2. Residue shall not be burned.
3. Tillage implements shall be equipped to operate through plant residues without clogging, and to maintain residue on or near the soil surface or mixed in the tillage layer.
4. Planters, drills, or air seeders shall be equipped to plant in residue distributed on the soil surface or mixed in the tillage layer.
5. The number, sequence, and timing of tillage and planting operations, and the selection of ground-engaging components, shall be managed to achieve the planned amount, distribution, and orientation of residue after planting or at other essential time periods. Acceptable alternative tillage sequences shall be initially determined by a residue budget using locally applicable data on residue production by crops and residue reduction by tillage machines. Further adjustments shall be made; as needed during the tillage sequence based on field measurements of remaining residue.

**Additional Criteria to Reduce Sheet and Rill Erosion**

1. The amount of residue needed to reduce erosion within the soil loss tolerance (T) or any other planned soil loss objective, shall be determined using current approved erosion prediction technology. The minimum amount of residue planned after planting must also be maintained from harvest through planting (except where cover crops are being grown to produce residue cover), as measured by the line transect method. Partial removal of residue by means such as baling or grazing shall be limited to retain the amount needed. Calculations shall account for the effects of other practices in the conservation management system (e.g. stripcropping, contour; stripcropping, field; etc.)

2. Tillage operations shall be limited to methods that leave residue on the surface and maintain the planned cover conditions.

**Additional Criteria to Reduce Wind Erosion**

The amount and orientation of residue needed to reduce erosion within the soil loss tolerance (T) or other planned soil loss objective shall be determined using current approved wind erosion prediction technology. The minimum amount of residue is 20% surface cover from harvest of the previous crop through planting of the present crop, as measured by the line transect method. Partial removal of residue by means such as baling or grazing shall be limited to retain the amount needed. Calculations shall account for the effects of other practices in the conservation management system.

**Additional Criteria to Maintain or Improve Soil Organic Matter Content and Tilth**

The amount of residue and the number and type of tillage operations needed to achieve the desired soil condition, shall be determined using the current approved soil conditioning index procedure. Partial removal of residue by means such as baling or grazing shall be limited to retain the amount needed. Calculations shall account for the effects of other practices in the conservation management system. The minimum amount of residue to maintain is 4,000 lbs/ac/year of crop residue, as measured after crop harvest.

**Additional Criteria to Provide Food and Escape Cover for Wildlife**

The amount of residue and height of stubble needed to provide cover shall be determined using the Ohio Habitat Evaluation Procedure. Residues shall not be removed unless it is determined by the habitat evaluation procedure that removal would not adversely affect habitat values (e.g. wheat or oats straw baled but the stubble remains). Stubble shall be maintained standing over winter. Tillage shall be delayed until spring, in order to maintain waste grain on the soil surface during winter.

**CONSIDERATIONS**

1. Excess removal of plant residue by such means as baling or grazing often produces negative impacts on resources. These activities should not be performed without full evaluation of impacts on soil, water, animal, plants, and air.

2. Mulch till may be practiced continuously throughout the crop sequence, or may be managed as part of a residue management system that includes other tillage methods such as no till. Selection of acceptable tillage methods for specific site conditions may be aided by an approved Soil Tillage Suitability Rating.

3. Production of adequate amounts of crop residue necessary for the proper functioning of this practice can be enhanced by selection of high residue producing crops and crop varieties in the rotation, use of cover crops, and adjustment of plant populations and row spacings.

4. Where improvement of soil tilth is a concern, use of undercutting tools will enhance accumulation of organic material in the surface layer.

5. The effectiveness of stubble to trap snow increases with stubble height. Variable height stubble patterns may be created to further increase snow storage.

6. Leaving rows of unharvested crop standing at intervals across the field can enhance the value of residues for wildlife habitat.

## PLANS AND SPECIFICATIONS

Specifications for establishment and operation of this practice shall be prepared for each field or treatment unit according to the Criteria, Considerations, and O&M described in this standard. Specifications shall be recorded using approved job sheet 329 a& b, narrative statements in the conservation plan, or other acceptable documentation. The minimum required documentation for this practice is outlined on the last page of this standard.

## OPERATION AND MAINTENANCE

1. Adjusting the tillage tools and timing to achieve the planned residue levels.
2. Spread residue evenly behind harvesting equipment.

## REFERENCES

National Residue Management, Mulch Till (329b), March 1999

| **Practice Documentation For:** | *Residue Management, Mulch Till 329B* |
|---|---|
| **The following documentation must be in the case folder or engineering subfolder.** | |
| **Practice Planning** | |
| 1. Is the practice part of a conservation plan?<br>2. Have the purpose(s) for the practice been identified?<br>3. Is the location of the practice identified on a map or plan drawing? | |
| **Practice Design** | |
| Have the following design criteria been addressed?<br>1. Timing and method(s) of tillage for residue management.<br>2. Types and amounts (% or pounds) of residue being managed to achieve planned purpose(s).<br>3. Rotation(s).<br>4. Acres planned. | |
| **Practice Installation / Application** | |
| Does the practice meet the minimum criteria for the planned purpose(s)? | |
| Have the following criteria been documented in the assistance notes or practice jobsheet?<br>1. Amounts, and types of residue being managed.<br>2. Timing and types of tillage used.<br>3. Acres applied. | |
| **Practice Deficiencies** | |
| If applicable, have the practice deficiencies been communicated with the decisionmaker? | |
| **Practice Maintenance** | |
| Have the following maintenance actions been communicated to the decisionmaker?<br>1. Adjusting the tillage tools and timing to achieve the planned residue levels. | |
| **Other Comments**: | |